EPA WATER SECURITY RESEARCH AND TECHNICAL SUPPORT PLAN

Testimony of

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and

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"*Homeland Security Research and Development at the EPA: Taking Stock and Looking Ahead*"

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Good afternoon, Chairman Ehlers and members of the Committee. Thank you for the invitation to discuss the security of our nation's water systems. I am Gregory B. Baecher, Professor of Civil and Environmental Engineering at the University of Maryland, and a member of the National Research Council Panel on Water System Security Research. The National Research Council (NRC) is the operating arm of the National Academy of Sciences, National Academy of Engineering, and the Institute of Medicine of the National Academies, chartered by Congress in 1863 to advise the government on matters of science and technology. The Panel on Water System Security Research was organized by the National Research Council's Water Science and Technology Board in response to an Environmental Protection Agency request to review EPA Homeland Security efforts in the areas of water systems and safe buildings.

The consequences of a terrorist attack on the nation's water supply to public health, national security, and the nation's economic services could be significant. Terrorist incidents of the recent past have heightened concerns regarding the vulnerabilities of public water systems to deliberate attack. The Environmental Protection Agency (EPA) bears lead responsibilities for protecting water systems from terrorist threats, and the agency is working in partnership with federal, state, and local government agencies, water and wastewater utilities, and professional associations to ensure safe water supplies.

To support its water security responsibilities, the EPA developed the *Water Security Research and Technical Support Action Plan* (*Action Plan*), released in 2003, which identifies criti-

cal security issues for drinking water and wastewater, outlines research and technical support needs within these issues, and presents a prioritized list of research and technical support projects to address these needs. The *Action Plan* is being used by EPA to establish funding priorities for water security research and technical support efforts over a three-year period.

The National Research Council's Panel on Water System Security Research conducted a review of the *Action Plan* from May through September of 2003. The report resulting from our studies provides an assessment according to the following questions: (1) has the *Action Plan* completely and accurately identified important issues and needs for water security; and if not, what issues and needs should be added; (2) are the needs appropriately sequenced; (3) are the projects recommended for funding in the *Action Plan* appropriate to meet our water security needs, are they correctly prioritized and sequenced, and is their timing realistic; and (4) overall, what changes of content or structure in the *Action Plan* are recommended to improve the presentation to convey more clearly the water security research and technical support program that is described? It should be noted that the panel was reviewing a work in progress and also that we functioned on a very fast timetable. The panel focused its review on an April 2003 draft of the *Action Plan*, although the program was continuously maturing during the review period, and many developments have undoubtedly occurred since the review was completed.

At your Committee's request, my comments focus on:

- Key findings and recommendations of the National Academies' report, *A Review of the EPA Water Security Research and Technical Support Plan (Parts 1 & 2)*; and
- Collaboration among EPA, the Department of Homeland Security (DHS), and other interests, to ensure that EPA is properly focusing its research agenda; and what steps EPA and DHS should take to improve this collaboration?

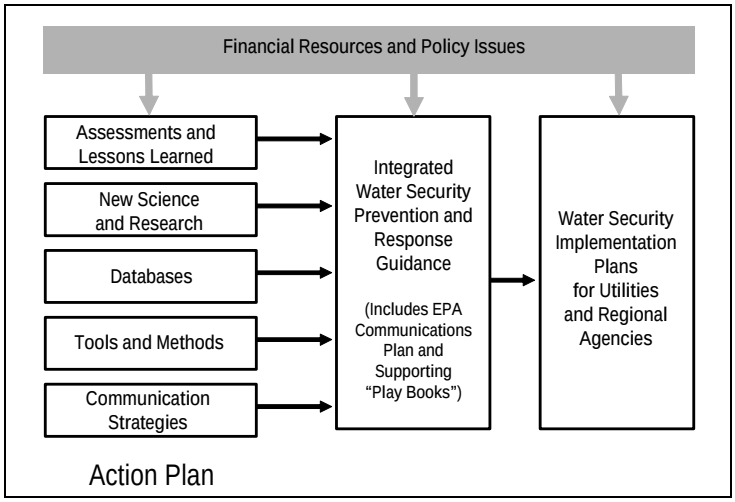
KEY FINDINGS AND RECOMMENDATIONS

Given the urgency and limited time within which EPA has been working on water security, our panel commended EPA for the speed and diligence of its efforts. Nevertheless, given time and resource constraints on the water security program, the panel recognized that EPA needed to prioritize its efforts to meet urgent needs, while simultaneously preserving a longer-term research and technical support strategy for water security and remaining mindful of the agency's other essential tasks that contribute to public health and security. In order to assist the EPA in prioritizing its water security efforts, the panel recommended that the EPA focus on building a *practical* program of water security research and technical support, emphasizing a continuing improvement in response and recovery capacity, while identifying cost-effective countermeasures based on an understanding of the nature and likelihood of potential threats.

The *Action Plan* contains an extensive list of drinking water and wastewater research and technical support needs and associated projects that cover many critical water security issues. However, the projects will not, in themselves, result in improved protection of the nation's drinking water and wastewater systems. Improved protection will result only when the information and knowledge gained from the projects are integrated into funded water security plans that are implemented by collaborations among private and public organizations.

The figure below suggests a framework for how individual research and technical support projects contained in the *Action Plan* could contribute to improved water security. Specifically, the *Action Plan* encompasses data collection and assessments; database creation; new scientific research, tools and methods development; and communication strategies. In order to assist utilities and regional agencies in utilizing this information, our panel suggested that a comprehensive

guidance document be developed that would direct a utility through available prevention strategies, information resources, communication planning, and response and recovery actions.



Example framework for depicting the contributions of the Water Security Research and Technical Support Action Plan to the broader needs for protecting the nation's water systems (including drinking water and wastewater).

The *Action Plan* recognizes that information is essential to effective response and recovery programs, but there should be emphasis on making this information immediately useful. If an event were to happen tomorrow, water systems, local and state health departments, and emergency response agencies would have to respond on the basis of whatever information was available. The ability to respond and recover will be a process of successive approximations that will improve as information and methods improve. The *Action Plan* should be implemented with this iterative process in mind.

The panel was concerned by the management responsibilities arising from the *Action Plan*. Project managers will need to be continually aware of related activities inside and outside EPA to minimize duplication of effort and to allow updating of protocols as new data are generated. If projects suffer from frequent change of leadership, coordination will be impaired, harming essential integrating functions. The panel suggested that EPA implement a management plan that includes adequate resources and stable leadership to coordinate the many projects. This plan

should include a schedule for reviewing the progress of the overall water security effort and for periodically reassessing priorities.

The *Action Plan* is silent on the financial resources required to complete the proposed research and technical support projects and to implement the countermeasures needed to improve water security. The panel concluded that the EPA should attempt to quantify benefits and costs resulting from the proposed research and technical support projects, and further study should be directed to better acknowledging business-enabling, dual-use benefits of security enhancements. More emphasis is needed on communicating the value of water and increased water system security with the public, rate regulators, and local elected and appointed officials, because increased revenues through user-rate increases or reallocations of resources will be needed to create the necessary financial resources to implement such countermeasures.

The panel recognized the need to act quickly to address issues of water security. The EPA strategy in the *Action Plan* to emphasize immediate usability and first approximations is a sound one, but certain research or technological advances may be accomplished only through long-term research investments. The panel recommended that the *Action Plan* clarify which of its research activities are short-term, applied efforts and highlight long-term research needs, so that a collaboration of agencies could work to ensure that substantive, mission-oriented research questions in water security are not overlooked.

COLLABORATION AMONG EPA, DHS, AND OTHER INTERESTS

The *Action Plan* concentrates, understandably, on matters that the EPA has traditionally handled and for which it has expertise. While there have been problems of both overlap and gaps in the activities of the EPA and other federal agencies under ordinary circumstances, the

lack of urgency in most cases has allowed these issues to be addressed over time. In the midst of an emergency, however, time may not allow for the discovery that a critical activity, which was thought to be under the control of another agency, had been overlooked due to poor coordination. Although the *Action Plan* recognizes the importance of coordination among relevant agencies, there are assumptions made throughout the *Action Plan* about the activities and capabilities of other agencies that may not be correct or may be over stated.

The rapidity and high stakes of potential terrorist attacks on water supplies suggest that the EPA should pay particular attention to improving interagency coordination and to determining the roles, capabilities, and training of other agencies with regard to water security. The special circumstances of a purposeful attack will require that the roles and responsibilities of various relevant parties (including law enforcement, FBI, and environmental and public health authorities) be worked out in detail ahead of time. The use of field and table-top simulation exercises is necessary to help utilities and federal, state and local agencies develop improved coordination and response and recovery strategies. All personnel who would respond to a water system attack should be involved, including water and wastewater utilities, police, public health workers, and emergency medical personnel.

The events contemplated by the *Action Plan* take place in the context of a potential crime. Roles and responsibilities of cognizant parties, including law enforcement, must be established ahead of time. The anthrax episodes of 2001 brought this into sharp relief. Legal issues related to criminal investigations, such as chain of custody, preservation of evidence, and control of information need to be considered in advance; the need for information dissemination to the public, to environmental response teams, and to health authorities will create opposing demands at critical times.

Developing an effective communication strategy that meets the needs of the broad range of stakeholders, including response organizations, water organizations and utilities, public health agencies, and the media, while addressing security concerns, should be among the highest priorities for the EPA. Criteria for classifying and distributing sensitive information should be developed that recognize the need for all water utilities, local and state agencies, researchers and consultants to have access to water security information. Consideration needs to be taken of how the water security information databases will be accessed, who will be granted access, who will control and update databases, and how new databases will be integrated with current systems. The EPA should thoroughly examine the consequences of various levels of information security and fund formal studies on the risks and benefits of widely transmitting water security data (including involvement of a wider research community). The dangers of keeping information too closely guarded may, in fact, be greater than those of informing an ill-intentioned person.

Action Plan Projects and Implementation

The drinking water research needs and projects identified in the *Action Plan* are lengthy and detailed, and, if pursued, would provide significant information, tools, and methods to help water managers respond to threats or attacks. Less information is presented in the *Action Plan* regarding threats to the nation's wastewater infrastructure, making it difficult to assess the adequacy of the proposed research. In its review of the *Action Plan*, the panel proposed revisions to the 35 water security needs and suggested two additional needs. The panel also evaluated the focus, priority, and timing of 123 projects, and suggested 18 new projects.

The *Action Plan* discusses how to conduct the research through collaborations with other organizations but at the time of the review did not include plans for funding this research or integrating the results into effective preparedness and response plans for the nation's utilities. The

panel concluded that an implementation plan was needed that would clearly articulate the roles and responsibilities of other organizations and federal agencies in respect to implementation of this research and technical support plan. Not all water security research and technical support guidance will be the responsibility of the EPA, but in order to develop effective collaborations, clear allocations of responsibilities are needed. In order to facilitate fast and effective implementation of this research plan, the panel recommended that the *Action Plan* include a thorough and up-to-date assessment of water security research activities that are underway in other agencies or organizations (e.g., the Department of Defense and universities) as well as a summary of related ongoing EPA efforts, beyond those outlined in the *Action Plan*.

Plans should also be included for communicating research findings and distributing the tools resulting from the *Action Plan* projects to stakeholders in a timely manner. For example, risk communication is a critical component in an overall crisis management strategy. The EPA needs to consider how to incorporate the current state of the knowledge in risk communication into its guidance to water utilities and organizations.

Again, thank you for the opportunity to discuss the safety of our nation's water systems. Drinking water is critical to public health and the nation's security and economy. The EPA activities that were the subject of our studies are critical to the nation's safety and should continue, considering the recommendations of our panel. I will be happy to answer questions you may have.

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DISCLOSURE STATEMENT

PROJECT TITLE:	EPA Homeland Security Efforts: Water Security Research and Technical Support
SPONSOR:	Environmental Protection Agency
SPONSOR AWARD NO;	68-C-03-037, Work Assignment #0-2
TOTAL POTENTIAL AWARD:	$181,000
AMOUNT OBLIGATED:	$181,000